

from the group consisting of:

- a. a leptin receptor selected from the group consisting of OB-Ra, OB-Rb, OB-Rc, OB-Rd, and OB-Re, or allelic variants thereof;
- b. a leptin receptor selected from the group consisting of:
- i. N-terminal corresponding to OB-Ra through Lys<sup>889</sup> and C-terminal corresponding to a C-terminal selected from the group consisting of OB-Rb, OB-Rc, and OB-Rd after Lys<sup>889</sup>;
  - ii. N-terminal corresponding to OB-Rb or OB-Rc through Lys<sup>889</sup>, and C-terminal corresponding to OB-Ra or OB-Rd after Lys<sup>889</sup>;
  - iii. N-terminal corresponding to OB-Rd through Lys<sup>889</sup>, and C-terminal corresponding to OB-Ra, OB-Rb, or OB-Rc after Lys<sup>889</sup>;
  - iv. N-terminal corresponding to SEQ ID NO:55 from Pro<sup>664</sup> to Lys<sup>889</sup>, and C-terminal corresponding to OB-Ra, OB-Rb, OB-Rc, or OB-Rd after Lys<sup>889</sup>;
  - v. N-terminal corresponding to SEQ ID NO:55 from Met<sup>733</sup> to Lys<sup>889</sup>, and C-terminal corresponding to OB-Ra, OB-Rb, OB-Rc, or OB-Rd after Lys<sup>889</sup>;
  - vi. N-terminal selected from the group consisting of OB-Ra, OB-Rb, OB-Rd, and SEQ ID NO:55 from Pro<sup>664</sup> through His<sup>796</sup>, and OB-Re from His<sup>796</sup>;
  - vii. N-terminal corresponding to SEQ ID NO:55 from Met<sup>733</sup> to His<sup>796</sup>, and OB-Re from His<sup>796</sup>; and
  - viii. allelic variants of any of subparts i. through vii. above;
- c. a leptin receptor wherein
- i. the N-terminal sequence is selected from the group consisting of
    - (1) amino acid residues 1-889;
    - (2) amino acid residues 23-889;

- (3) amino acid residues 28-889;
- (4) amino acid residues 133-889;
- (5) amino acid residues 733-889;
- (6) amino acid residues 1-796;
- (7) amino acid residues 23-796;
- (8) amino acid residues 28-796;
- (9) amino acid residues 28-796 preceded by an N-terminal

Asp-Pro dipeptide;

- (10) amino acid residues 133-796;
- (11) amino acid residues 733-796; and
- (12) allelic variants of any of (1) through (11) above; and

ii. the C-terminal sequence is selected from the group consisting of

- (1) SEQ ID NO:11;
- (2) SEQ ID NO:12;
- (3) SEQ ID NO:13;
- (4) SEQ ID NO:14; and
- (5) SEQ ID NO:15 after His<sup>796</sup>;

d. a leptin receptor having an amino acid sequence selected from the group consisting of

- i. Asp-Arg-Trp-Gly-Ser-Tyr<sup>420</sup> (SEQ ID NO:77) → Pro<sup>641</sup>;
- ii. Asp-Arg-Trp-Gly-Ser-Ser<sup>118</sup> (SEQ ID NO:78) → Pro<sup>641</sup>;
- iii. Asp-Arg-Trp-Gly-Ser-Leu<sup>123</sup> (SEQ ID NO:79) → Val<sup>331</sup>; and

e. a leptin receptor as described in (a)-(d) above in which a cysteine is substituted with an amino acid selected from the group consisting of serine, threonine, and alanine;

wherein the numbering is based on the amino acid sequence of SEQ ID NO:55.

68. A method for diagnosing body weight abnormalities in a mammal comprising detecting splice variants of OB-R in a patient sample comprising contacting a sample suspected of containing splice variants of OB-R with an oligonucleotide hybridizable under stringent conditions to the nucleic acid molecule which codes on expression for a polypeptide selected from the group consisting of SEQ ID NOS: 2, 4, 6, 8 and 10.

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69. A method for measuring the expression of splice variants of OB-R in a patient sample comprising contacting a sample suspected of containing splice variants of OB-R with a oligonucleotide hybridizable under stringent conditions to the nucleic acid molecule which codes on expression for a polypeptide selected from the group consisting of:

a. a leptin receptor selected from the group consisting of OB-Ra, OB-Rb, OB-Rc, OB-Rd, and OB-Re, or allelic variants thereof;

b. a leptin receptor selected from the group consisting of:

- i. N-terminal corresponding to OB-Ra through Lys<sup>889</sup> and C-terminal corresponding to a C-terminal selected from the group consisting of OB-Rb, OB-Rc, and OB-Rd after Lys<sup>889</sup>;
- ii. N-terminal corresponding to OB-Rb or OB-Rc through Lys<sup>889</sup>, and C-terminal corresponding to OB-Ra or OB-Rd after Lys<sup>889</sup>;
- iii. N-terminal corresponding to OB-Rd through Lys<sup>889</sup>, and C-terminal corresponding to OB-Ra, OB-Rb, or OB-Rc after Lys<sup>889</sup>;
- iv. N-terminal corresponding to SEQ ID NO: 55 from Pro<sup>664</sup> to Lys<sup>889</sup>, and C-terminal corresponding to OB-Ra, OB-Rb, OB-Rc, or OB-Rd after Lys<sup>889</sup>;
- v. N-terminal corresponding to SEQ ID NO:55 from Met<sup>733</sup> to Lys<sup>889</sup>, and C-terminal corresponding to OB-Ra, OB-Rb, OB-Rc, or OB-Rd after Lys<sup>889</sup>;
- vi. N-terminal selected from the group consisting of OB-Ra, OB-Rb,

OB-Rd, and SEQ ID NO:55 from Pro<sup>664</sup> through His<sup>796</sup>, and OB-Re from His<sup>796</sup>;

vii. N-terminal corresponding to SEQ ID NO:55 from Met<sup>733</sup> to His<sup>796</sup>, and OB-Re from His<sup>796</sup>; and

viii. allelic variants of any of subparts i) through vii) above;

c. a leptin receptor wherein

i. the N-terminal sequence is selected from the group consisting of

- (1) amino acid residues 1-889;
  - (2) amino acid residues 23-889;
  - (3) amino acid residues 28-889;
  - (4) amino acid residues 133-889;
  - (5) amino acid residues 733-889;
  - (6) amino acid residues 1-796;
  - (7) amino acid residues 23-796;
  - (8) amino acid residues 28-796;
  - (9) amino acid residues 28-796 preceded by an N-terminal Asp-Pro dipeptide;
  - (10) amino acid residues 133-796;
  - (11) amino acid residues 733-796; and
  - (12) allelic variants of any of subparts (1) through (11) above;
- and

ii. the C-terminal sequence is selected from the group consisting of

- (1) SEQ ID NO:11;
- (2) SEQ ID NO:12;
- (3) SEQ ID NO:13;
- (4) SEQ ID NO:14; and
- (5) SEQ ID NO:15 after His<sup>796</sup>;

- d. a leptin receptor having an amino acid sequence selected from the group consisting of
- i. Asp-Arg-Trp-Gly-Ser-Tyr<sup>420</sup> (SEQ ID NO:77) → Pro<sup>641</sup>;
  - ii. Asp-Arg-Trp-Gly-Ser-Ser<sup>118</sup> (SEQ ID NO:78) → Pro<sup>641</sup>;
  - iii. Asp-Arg-Trp-Gly-Ser-Leu<sup>123</sup> (SEQ ID NO:79) → Val<sup>331</sup>; and
- e. a leptin receptor as described in (a)-(d) above in which a cysteine is substituted with an amino acid selected from the group consisting of serine, threonine, and alanine; wherein the numbering is based on the amino acid sequence of SEQ ID NO:55.

70. A method for measuring the expression of splice variants of OB-R in a patient sample comprising contacting a sample suspected of containing splice variants of OB-R with a oligonucleotide hybridizable under stringent conditions to the nucleic acid molecule which codes on expression for a polypeptide selected from the group consisting of SEQ ID NOS: 2, 4, 6, 8 and 10.

71. The method of any of claims 67-70 wherein the oligonucleotide is labeled.

72. The method of any of claims 67-70 wherein the nucleic acid molecule is RNA.

Please amend the claims as follows:

29. (Amended) An oligonucleotide hybridizable under stringent conditions to the nucleic acid molecule encoding on expression a leptin receptor polypeptide selected from the group consisting of:
- a. a DNA molecule of SEQ ID NO:1, 3, 5, 7, or 9;
  - b. a DNA molecule complementary to the DNA molecule defined in (a);
  - c. a DNA molecule which hybridizes to the DNA molecule of (a) or (b), or a hybridizable fragment thereof;

d. a DNA molecule which is identifiable with a polymerase chain reaction (PCR) probe selected from group consisting of a probe for clone 7 (forward primer SEQ ID NO:42 and reverse primer SEQ ID NO:43), a probe for clone 11 (forward primer SEQ ID NO:44 and reverse primer SEQ ID NO:45), and both clone 7 and clone 11; and

e. a DNA molecule that codes on expression for the polypeptide encoded by any of the foregoing DNA molecules [of claim 24].

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30. (Amended) An oligonucleotide hybridizable under stringent conditions to the nucleic acid molecule which codes on expression for a polypeptide selected from the group consisting of:

f. a leptin receptor selected from the group consisting of OB-Ra, OB-Rb, OB-Rc, OB-Rd, and OB-Re, or allelic variants thereof;

g. a leptin receptor selected from the group consisting of:

i. N-terminal corresponding to OB-Ra through Lys<sup>889</sup> and C-terminal corresponding to a C-terminal selected from the group consisting of OB-Rb, OB-Rc, and OB-Rd after Lys<sup>889</sup>;

ii. N-terminal corresponding to OB-Rb or OB-Rc through Lys<sup>889</sup>, and C-terminal corresponding to OB-Ra or OB-Rd after Lys<sup>889</sup>;

iii. N-terminal corresponding to OB-Rd through Lys<sup>889</sup>, and C-terminal corresponding to OB-Ra, OB-Rb, or OB-Rc after Lys<sup>889</sup>;

iv. N-terminal corresponding to SEQ ID NO:55 from Pro<sup>664</sup> to Lys<sup>889</sup>, and C-terminal corresponding to OB-Ra, OB-Rb, OB-Rc, or OB-Rd after Lys<sup>889</sup>;

v. N-terminal corresponding to SEQ ID NO:55 from Met<sup>733</sup> to Lys<sup>889</sup>, and C-terminal corresponding to OB-Ra, OB-Rb, OB-Rc, or OB-Rd after Lys<sup>889</sup>;

vi. N-terminal selected from the group consisting of OB-Ra, OB-Rb,

OB-Rd, and SEQ ID NO:55 from Pro<sup>664</sup> through His<sup>796</sup>, and OB-Re from His<sup>796</sup>.

vii. N-terminal corresponding to SEQ ID NO:55 from Met<sup>733</sup> to His<sup>796</sup>, and OB-Re from His<sup>796</sup>; and

viii. allelic variants of any of subparts i. through vii. above;

h. a leptin receptor wherein

i. the N-terminal sequence is selected from the group consisting of

- (1) amino acid residues 1-889;
- (2) amino acid residues 23-889;
- (3) amino acid residues 28-889;
- (4) amino acid residues 133-889;
- (5) amino acid residues 733-889;
- (6) amino acid residues 1-796;
- (7) amino acid residues 23-796;
- (8) amino acid residues 28-796;
- (9) amino acid residues 28-796 preceded by an N-terminal

Asp-Pro dipeptide;

- (10) amino acid residues 133-796;
- (11) amino acid residues 733-796; and
- (12) allelic variants of any of (1) through (11) above; and

ii. the C-terminal sequence is selected from the group consisting of

- (1) SEQ ID NO:11;
- (2) SEQ ID NO:12;
- (3) SEQ ID NO:13;
- (4) SEQ ID NO:14; and
- (5) SEQ ID NO:15 after His<sup>796</sup>.

i. a leptin receptor having an amino acid sequence selected from the group